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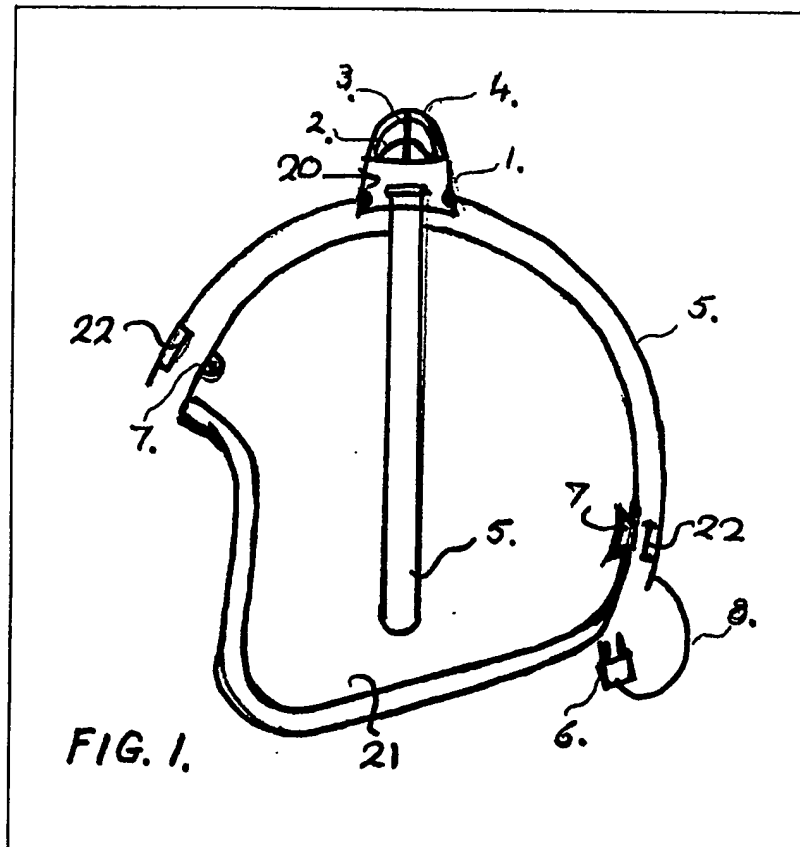
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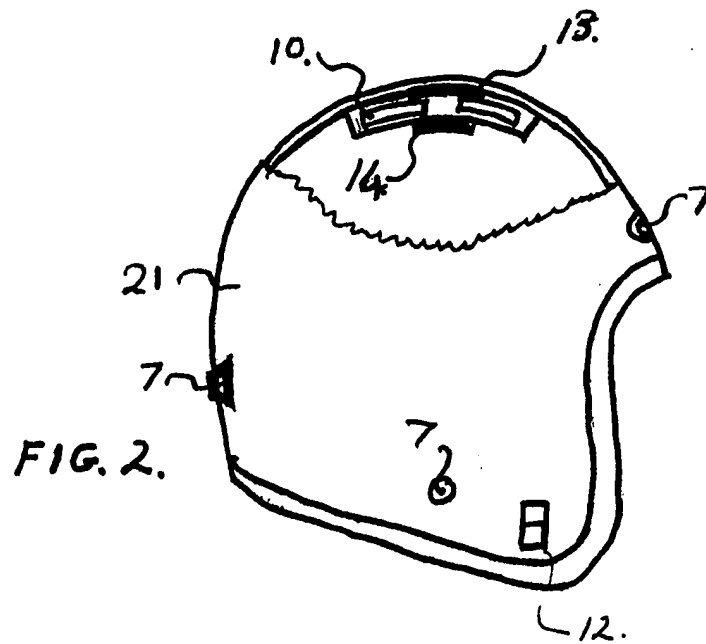
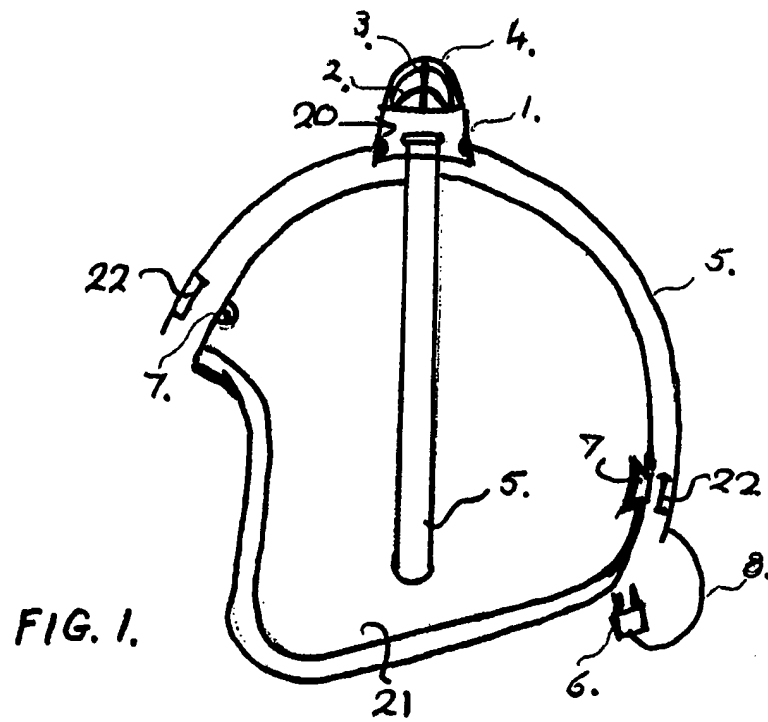
(54) Protective headwear

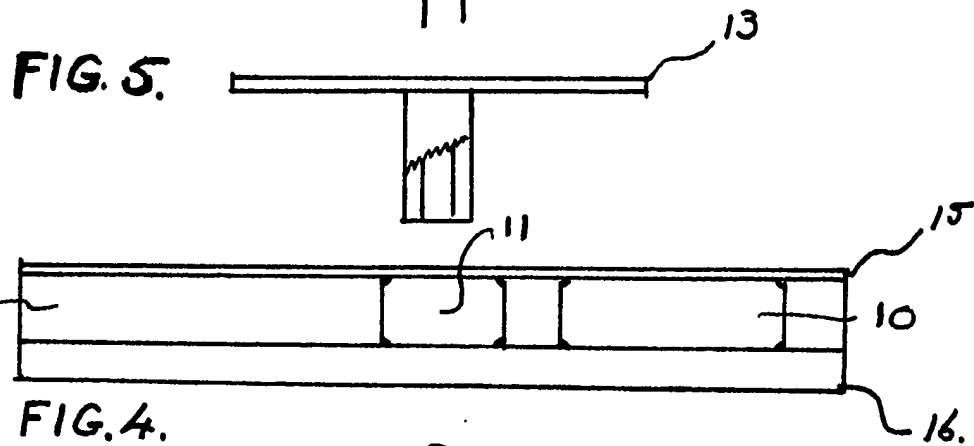
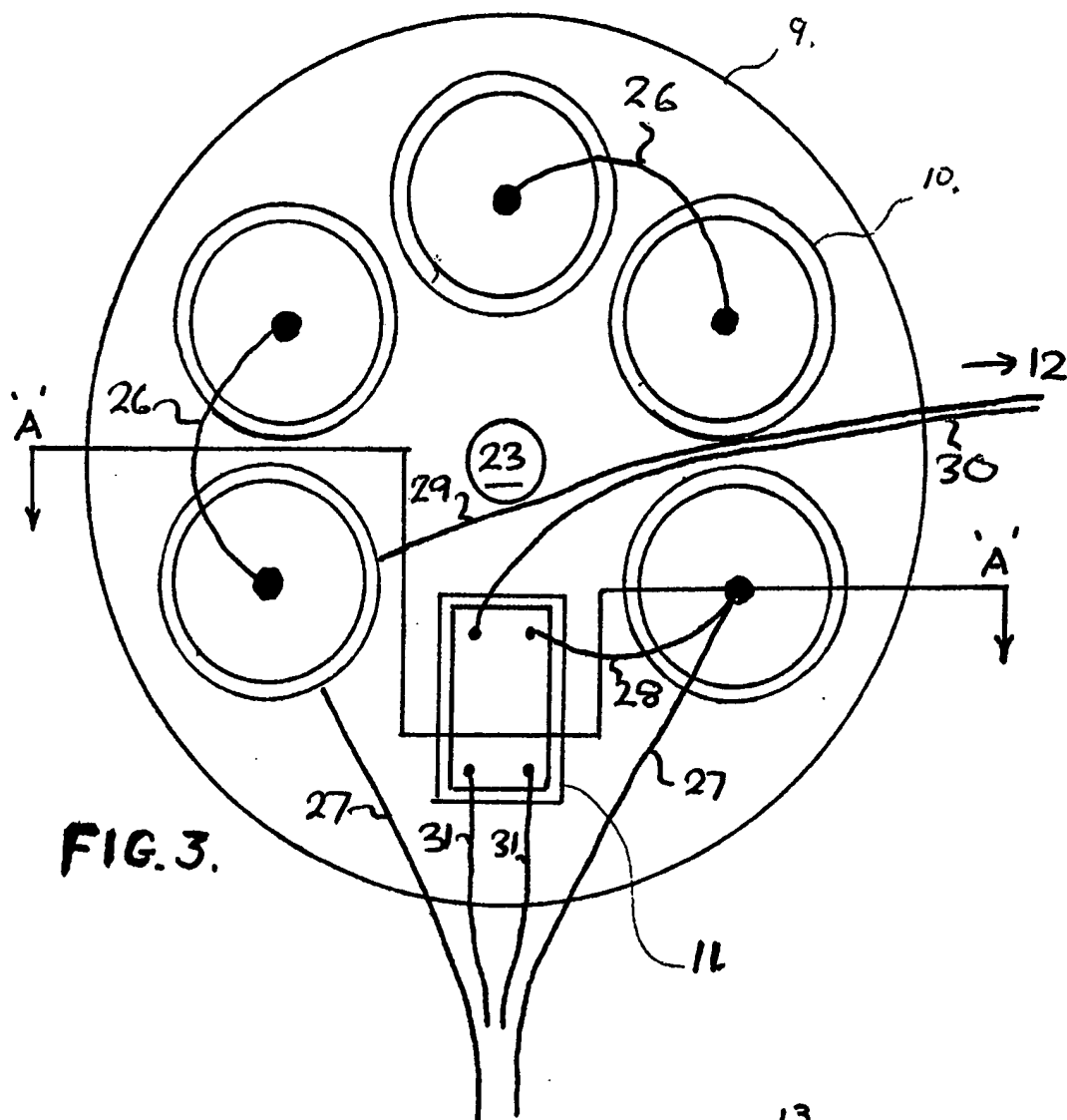
(57) There is provided protective headwear (21) having mounted, preferably detachably mounted, at its crown a flashing light unit (20). There is also provided circuitry for the light unit comprising a flasher device and, within the headwear, a power unit.

The headwear according to the present invention may be worn in any situation in which there is a risk of an accident, at dusk, during the hours of darkness and generally at times of poor light and most particularly for wear by motorcyclists, road repairers, emergency and accident recovery personnel, especially on motorways, and aircraft control personnel.



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SPECIFICATION

Protective headwear

This invention relates to protective headwear.

Many tragic and costly accidents to people occur simply because the person in question has not been observed at all or not observed in sufficient time to prevent the accident occurring. This is particularly the case at dusk, during the hours of darkness and generally when there is poor light. However the same problems can also occur in good light if the observer is not expecting to see or concentrating on seeing a person in a particular situation. For example it is widely believed that many accidents between

motorcycles or pedal cycles and cars occur simply because the car driver has not observed the motorcycle or pedal cycle coming towards him.

In addition to motorcyclists and pedal cyclists, others on the road who may be at danger include personnel engaged on road repairs during poor light. Also emergency personnel, e.g. policemen, firemen and ambulancemen, and accident recovery personnel attending the scene of an accident, particularly on motorways, are similarly at risk. The same dangers can also occur away from the road. For example on a building site or on an airfield e.g. for ground personnel engaged in aircraft traffic control.

According to the present invention there is provided protective headwear having a light unit mounted on its crown and comprising circuitry connected to the light unit including a flashing device for the light and, within the headwear, a power source for the light unit. The circuitry of the present headwear will generally include an on/off switch so that the wearer may switch the light unit on only when required.

Thus the headwear according to the present invention comprises a self-contained unit which can be worn with a flashing light at the crown. The headwear can be worn by anyone and/or in any situation where there is a danger of an accident occurring simply by virtue of the person not being seen. The flashing unit on the headwear according to the present invention greatly increases the chances of the person being observed and within sufficient time for an accident to be avoided. The headwear according to the present invention may be worn by a cyclist at dusk, during the hours of darkness or at times of poor light (or indeed at any other time) in which case the headwear will take the form of a crash helmet. The headwear according to the present invention may for example be used by road repairers, emergency and accident recovery personnel attending the scene of an accident, ground personnel at an airport or building workers. In each case the actual form of the protective headwear itself may vary in shape in accordance with that customarily used but in all cases it will have mounted on its crown a light unit and have mounted within it a power source for that light unit in accordance with the invention.

It will be appreciated that the wearer will not

always wish to have his light unit flashing and indeed he may prefer not to have the light unit in place when it is not in use. Preferably therefore the light unit is detachably mounted on the helmet in order for example that the wearer can simply detach the light unit and store it e.g. in a pocket until it is required. The light unit will then be provided with electrical connection means for connection with the circuitry and power unit within the protective headwear e.g. a plug/socket combination. Preferably, in order to preserve the strength of the protective headwear, its strength is not impaired for example by the drilling of holes through or in any other way.

In one preferred embodiment the light unit is mounted on, preferably four at right angles to each other, extensible strips which may be secured to the headwear, e.g. by press fasteners, to hold the light unit in position on the headwear. Most preferably one of these extensible strips, when the light unit is in place, extends down the back of the protective headwear and covers wiring from the light unit, which wiring is provided with a plug/socket which is connectable with a socket/plug in the rear neck region of the protective headwear and connected to the power unit therein.

The light unit itself may provide light of any desired colour or colours. For example if it is desired to show different light colours front and rear the light may be provided with a cover which is of different colours front and rear. Suitably the light unit is provided with a guard to prevent unintentional damage e.g. a metal guard.

According to the present invention, the power unit for the light unit is mounted within the headwear. The headwear must of course still be comfortable on and provide adequate room for the head of the wearer. Thus the power unit used should be one of small size while still providing adequate power for the light unit; a plurality of single cell nickel-cadmium rechargeable batteries may be used for this purpose. Preferably the batteries are themselves mounted within the body of a resilient disc itself mounted, e.g. at the crown, within the helmet. The resilient disc provides comfort for the wearer and also protects the battery cells against unintentional damage. The flashing unit of the circuitry may also be housed in this resilient disc to protect it.

The invention is further illustrated by way of example in the accompanying drawings wherein:

Figure 1 is an exploded side view of a helmet, e.g. motorcyclists crash helmet, and detachably mounted light unit,

Figure 2 is the other side view of the helmet according to Figure 1 with part cut away,

Figure 3 is an enlarged schematic view of the power unit of the helmet of Figures 1 and 2,

Figure 4 is a section along the line A—A of Figure 3 through the power unit housing, and

Figures 5 and 6 show spigot 13 and pin 14 for use in the mounting of the power unit of Figure 3 within the helmet.

Referring to the drawings, the protective headwear comprises a light unit 20 and a helmet

21. Light unit 20 comprises a bulb holder 1 housing a bulb 2 under a Perspex cover 3 (Perspex is a registered trade mark) and a metal guard 4.

5 The bulb 2 is of sufficient capacity related to the power supply of the batteries of the power unit i.e. 6 (or 12) volt.

10 The base of bulb holder 1 is provided with four slots through which are passed two lengths of elasticated webbing 5 towards each end of each length of elasticated webbing 5 is provided a press fastener 22. Cable 8 leading from the bulb connections in bulb holder 1 is threaded through that part of webbing 5 extending, when the light unit 20 is in place, down the back of the helmet 21 and terminates with a two-pin male plug 6.

15 The helmet 21 has on its outer surface four press studs 7 and a rocker type on/off switch 12. Within the helmet at the rear of the neck portion is a female socket (not shown) into which plug 6 fits.

20 The light unit 20 is mounted on the helmet 21 by engaging the press fasteners 22 at the ends of each length of webbing 5 on the four press studs 7 on the helmet. In this position the elasticated webbing 5 is held in extended form and thus the light unit 20 is held firmly down on the helmet. The male plug 6 is then engaged in the female socket within the helmet ready for use. Of course when it is no longer required to have the light unit 20 on the helmet 21 it may simply be detached by 30 disconnecting the plug 6 and unfastening the press fasteners 22 to enable the unit 20 to be removed.

35 The power unit for the helmet shown in Figures 1 and 2 is provided, in the embodiment shown, by five nickel-cadmium rechargeable batteries 10, each of 1.2 volt capacity. Nickel-cadmium cells are particularly convenient because of their relatively small size facilitating their housing within the helmet and the fact that they are 40 rechargeable. The total number of cells to be used in any particular helmet will be determined by the required operating time for the light unit of the helmet. The battery cells 10 are housed in holes in a foam rubber disc 9. Also housed in foam rubber disc 9 is a signal flashing device 11. The centre of 45 foam rubber discs 9 has an aperture 23 therethrough. In order completely to insulate the battery cells 10 and hold them in position within foam rubber disc 9, the foam rubber disc 9 is held 50 between two rubber pads 15 and 16; pad 15 being of rubberised fabric and pad 16 being rubber sheeting. Both of pads 15 and 16 have an aperture therethrough in the centre corresponding to the aperture 23 in foam disc 9.

55 The power unit is fixed in the helmet as follows: Within the padding of the helmet 21 a moulded spigot 13 is secured to the inside of the crown of the helmet, e.g. using a suitable adhesive. Over this spigot 13 is placed the power unit assembly 60 of Figures 3 and 4 with the spigot 13 passing through the central apertures of pad 15, foam rubber disc 9 and pad 16. The whole is then secured in place by means of moulded rubber pin 14 which is pressed into and firmly held by 65 spigot 13.

The signal flashing device 11 is such that it controls a pulse of light to flash at approximately 1 second intervals.

70 The circuitry of the headwear shown in the Figures is explained below with particular reference to Figure 3. The nickel-cadmium battery cells 10 are connected in series with one another; the positive pole of one battery being connected to the negative pole of the adjacent battery; thus 75 only those connections 26 between cell batteries above the plane of foam rubber disc 9 are visible in Figure 3. The two end cell batteries of this series of batteries are connected, via cables 27 to a socket (not shown) at the rear of the base of the helmet. This socket is suitable for making a 80 connection with a battery charger when the cells require recharging, e.g. a 6/12 volt battery charger according to the number of cells used.

85 In addition the ends of the series of cell batteries are connected to one side of the flasher unit 11; one end via simple cable 28 and the other end via cable 29 and switch 12 to the outside of the helmet (see Figure 2) and cable 30. The other side of flasher unit 11 is connected via cables 31 90 to the socket at the rear and base of the helmet adapted to receive plug 6.

95 For use, the light unit 20 is fixed to the helmet 21 as described above and the plug 6 connected to its corresponding socket, which socket in turn is connected via cables 31 to one side of flasher unit 11. When the wearer is in a situation in which he 100 considers it would be desirable to start the light unit flashing, he switches switch 12, mounted to the outside of the helmet, to the on-position. Thus the circuit between the bulb 2 of the light unit 20 and the cell batteries 10 via the flasher unit 11 is completed and thus the light will commence 105 flashing increasing the visibility of the wearer of the helmet.

110 When it is no longer desired to have the light unit flashing, the switch 12 can simply be moved to the off-position. In addition, if desired, plug 6 can be disconnected and the light unit 20 removed from helmet 21 as described above.

115 When it is necessary to recharge the battery cells 10 within the helmet, a battery charger is connected to the socket connected to cables 27. Thus the circuit through the series of batteries is completed and the cells can be recharged without the necessity of removing them from the helmet.

Considerable attention has of course to be given to making the power unit safe and the helmet weatherproof.

CLAIMS

120 1. Protective headwear having a light unit mounted on its crown and comprising circuitry connected to the light unit including a flashing device for the light and, within the headwear, a power source for the light unit.

125 2. Protective headwear according to claim 1 wherein the light unit is detachably mounted and comprises electrical connection means adapted to connect with electrical connection means on the headwear connected with the power source.

3. Protective headwear according to claim 2 wherein the light unit is provided with extensible strips which engage, in extended condition, fasteners on the headwear firmly to hold the light unit down on the crown of the headwear.
- 5 4. Protective headwear according to any one of claims 1 to 3 wherein the flashing device for the light is also mounted within the headwear.
- 10 5. Protective headwear according to any one of claims 1 to 4 wherein the circuitry also includes a switch, the switch being mounted to the outside of the headwear.
6. Protective headwear according to any one of claims 1 to 5 wherein the power source is mounted within the headwear at its crown.
- 15 7. Protective headwear according to any one of claims 1 to 6 wherein the power source comprises rechargeable batteries, which may be recharged *in situ*.
- 20 8. Protective headwear according to any one of the preceding claims which is a motorcyclist's crash helmet.
9. Protective headwear substantially as hereinbefore described with reference to and
- 25 illustrated in the accompanying drawings.